

TECHNICAL DOCUMENT 3121
November 2001

**Quality System Plan for Command,
Control, Communications, Computers,
Intelligence, Surveillance, and
Reconnaissance Integration
Installation Teams**

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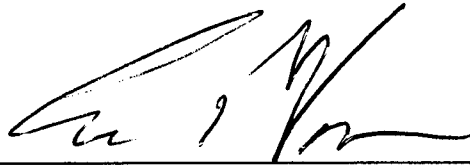
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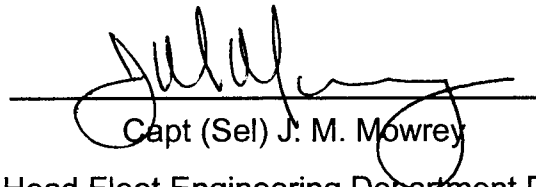
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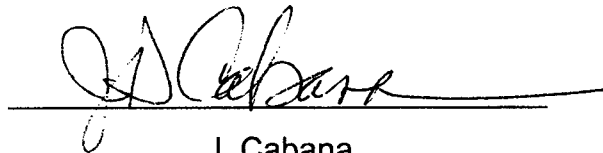
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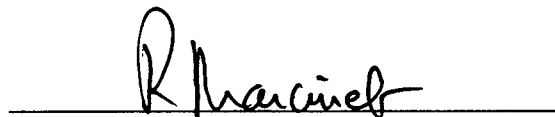
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RECORD OF CHANGES

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VISION

To be the Nation's pre-eminent provider of integrated C4ISR solutions for warrior information dominance.

PREFACE

Space and Naval Warfare Systems Center, San Diego (SSC San Diego) has developed this Quality System Plan to ensure our commitment to quality, better satisfy the needs of the Fleet, and to improve management of our organization. The quality system complies with American National Standard Institute/American Society for Quality Control (ANSI/ASQC) 9002, Naval Sea Systems Command (NAVSEA) Standard Item 009-04, NAVSEA Technical Specification 9090-310C, and the Port of San Diego Ship Repair Association Single Quality System. This system covers the installation design drawings, production, installation, and servicing of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) supplies and services. This manual presents the quality system to the Fleet and other interested activities, and informs them of the specific controls implemented to ensure product/installation quality.

1. SCOPE AND FIELD OF APPLICATION

1.1 PURPOSE

The Quality System Plan establishes a quality system that entails assurance and control requirements with the SSC San Diego Installation Management Office (IMO) for Integrated Installation Teams (IIT), D60F, and provides policy and guidance for their implementation. The objective of this quality system is to outline the requirements and responsibilities of IITs during the installation of Ship Alterations, Field Changes, and Engineering Changes. Basic guidance for these installations is contained in references 2.1.3, 2.1.4, and 2.1.8. This document is designed to provide understanding of the quality system in place to ensure the highest level of quality is achieved within cost and schedule.

1.2 APPLICATION

This document applies to all SSC San Diego ship and shore installations as identified in SSCSDINST 4720.1 and SSC Chesapeake Detachment Pacific. Work-authorizing documents will impose these requirements on other government activities and support contractors performing Alterations/Installations on ship or shore stations.

1.3 CHANGES AND REVISIONS

The SSC San Diego D60 Quality Manager will maintain this document in a controlled, complete, and accurate condition. Users are encouraged to send recommendations for change or improvement to Commanding Officer, Space and Naval Warfare Systems Center, Installation Management Office, D60F, 53560 Hull Street, San Diego, CA 92152-5001.

2. REFERENCED DOCUMENTS AND INSTRUCTIONS

2.1 TECHNICAL SPECIFICATIONS AND STANDARDS

2.1.1 MIL-STD-100G, Department of Defense Standard Practice, for Engineering Drawings

2.1.2 NAVSEA Standard Items

2.1.3 NAVSEA Technical Specification 9090-310C, Ship Alteration Accomplishment by Installation Teams (AIT)

2.1.4 NAVSEA Technical Specification 9090-100, SHIPALT Technical Liaison Services, Waivers, and Deviations

2.1.5 NAVSEA SL720-AA-MAN-010, Fleet Modernization Program (FMP) Management and Operations Manual Volume 1

2.1.6 NAVSEA SL720-AA-MAN-020, Fleet Modernization Program (FMP) Management and Operations Manual Volume 2

2.1.7 NAVSEA S9070-AA-MME-010/SSN/SSBN, dated 1 FEB 1993 Guidance Manual for Temporary Submarine Installations

2.1.8 Naval Ship's Technical Manual 0901-LP-017-5590

2.1.9 NAVSEA T9410-BU-PRO-010/MOD SOP, Rev A, Trident Command Control System Modification Development Standard Operating Procedure

2.1.10 AIT PIP-01-U-R0C0 SPAWARSYSCEN, San Diego Process Improvement Plan for Submarine Alteration Installation Team (AIT) 1 May 1997

2.1.11 OPNAVINST 4720.2G, Fleet Modernization Program (FMP) Policy

2.1.12 COMSUBLANT/COMSUBPAC INST 4131.1, Submarine Combat Systems Configuration Control

2.1.13 NAVSEAINST 4720.11C, Shipboard Installation and MODs Performed by Alteration Installation Team (AIT)

2.1.14 NAVSEAINST 4720.14, Temporary Alterations to Active Fleet Submarines

2.1.15 NAVSEAINST 4720.16, Logistics management for Configuration Changes Installed Outside of Depot Level Availabilities

2.1.16 CPF/CLFINST 4720.3 Process for Initiating, Approving, and Scheduling, Afloat C4I Systems Installations and Upgrades

2.1.17 SPAWARINST 4720.3C, SPAWAR Policy and Responsibilities for Installing Shipboard C⁴ISR Fleet Modernization Upgrades

2.1.18 NOSCINST 4000.1.E, Data Management Program and Data Management Office (DMO) Procedures for Procurement Requirements Review.

2.1.19 NRaDINST 4200, Development and Preparation of Task/Delivery Orders

2.1.20 SSCSDINST 4720.1, Shipboard Installation Guidelines, 7 December 1998

2.1.21 SUPSHIPSDIEGOINST 4855.G, PSDSRA/SSSD JOINT QUALITY ASSURANCE
CORRECTIVE ACTION PROGRAM

2.1.22 ANSI/ASQC 9002 American National Standard Institute/ American Society for Quality
Control Quality systems – Model for quality assurance in production and installation.

2.1.23 ANSI/NCSL Z540-1 1994 - American National Standard for Calibration - Calibration
Laboratories and Measuring and Test Equipment - General requirements

3. MANAGEMENT RESPONSIBILITY

3.1 COMMANDING OFFICER/EXECUTIVE DIRECTOR SSC SAN DIEGO

The Commanding Officer/Executive Director are responsible for the installation of all Space and Naval Warfare Systems Command (SPAWAR)-sponsored Command, Control, Communications, Computer, Intelligence Surveillance and Reconnaissance (C4ISR) systems (hardware, software, and networking) in ships of the U. S. Pacific Fleet.

3.2 SSC San Diego Head, Fleet Engineering, D60

The Fleet Engineering Department Head is responsible for the management of afloat C4ISR installations sponsored by SPAWAR. C4ISR system installation management in Battle Force (BF) ships commences at D-30 months in the BF interdeployment cycle (reference 2.1.17), and continues until deployment.

3.3 SSC SAN DIEGO, INSTALLATION MANAGEMENT OFFICE (IMO), D60F

The IMO ensures that systems are installed in ships in an integrated manner, fully warranted, and logistically supported with documentation, parts, and operator and maintenance training. The integrated installations in individual ships are completed so that the overall BF command, control, and communications continuity is achieved. The team of personnel under SSC San Diego IMO supervision (military or civilian) is trained and equipped to accomplish integrated installations. The teams consists of government employees assigned to field activities, naval shipyard employees, and civilian contractors. SSC San Diego has expanded the Reference 2.1.3 definition of Alteration Installation Teams (AIT) tasking, responsibility, and system integration to IIT.

3.4 IIT LEADER

The IIT Leader provides overall management and oversight of respective IITs through IIT BF Officers/Managers. The IIT Leader is responsible for all installations in ships of each assigned Battle Force, directs long-range planning starting at D-30 months, and ensures that all parties (ship and chain of command, IIT and chain of command, system managers and chain of command) are kept informed of planning. The IIT Leader ensures that all required reports and documentation are completed efficiently. The IIT Leader liaisons with SSC San Diego 05 and PMWs through SSC San Diego 04R-2 for engineering issues and with SSC San Diego 04 for funding issues. The San Diego IIT Leaders are responsible to the SSC San Diego D60 Fleet Engineering Department (D60) for the implementation and compliance of references 2.1.1 through 2.1.23.

3.5 IIT BATTLE FORCE OFFICER (BFO)/BATTLE FORCE MANAGER (BFM)

The IIT BFO/M schedules BF availability and resolution of work scheduling conflicts and issues. IIT BFO/M's liaison with SPAWAR 04F for BF scheduling issues and Type Commanders (TYCOMs), BF Commanders, and Commanding Officers to resolve BF availability scheduling and BF composition issues. BFO/Ms are responsible to the IIT Leader for BF scheduling, availability, and system readiness to install. BFO/Ms ensure timely submission of reports and other engineering documentation. BFO/Ms coordinate final authorization to install in BF ships.

3.6 IIT SHIP SUPERINTENDENT

The IIT Ship Superintendent represents the Commanding Officer, SSC San Diego, to Ship and Submarine Commanding Officers. The IIT Ship Superintendent is responsible for verifying that the work performed, within the scope of this document, adheres to the policy, procedures, and contract set forth. The IIT Ship Superintendent is the designated person with overall responsibility for the conduct of the team and the resolution of any problems that may arise, per reference 2.1.3. IIT Ship Superintendents have technical authority over contractor team members and shall be knowledgeable of and responsible for team adherence to all invoked requirements including safety and quality. The IIT Ship Superintendent provides a single point of contact between the ship and various community activities and coordinates installation with the NAVSEA Southwest Regional Maintenance Management Office. The Ship Superintendent reports to the IIT Quality Manager for Safety and Quality issues.

3.7 IIT NAVY TECHNICAL REPRESENTATIVE (NTR)/SUBJECT MATTER EXPERT (SME)

The IIT NTR/SME is responsible for installation of individual C4ISR systems in BF ships. The IIT NTR/SME writes the Statement of Work (SOW), reviews cost estimates, issues Delivery Orders, and initiates/reviews Change Order Request Notifications (CORNs) for contractor support as required. The IIT NTR/SME provides system engineering, technical direction, and inspection during installation. The NTR/SME reviews Ship Installation Drawings (SIDs) before and during installation and updates and annotates as required to develop final installation as-built drawings. The IIT NTR/SME conducts System Operation Verification Testing (SOVT) and provides operator and maintenance training, delivers drawings, configuration change forms, and other system Integrated Logistic Support (ILS) to ships, as necessary. The IIT NTR/SME updates the Ship Selected Record (SSR), as necessary. The IIT NTR/SME reports to SSC San Diego the Technical Code for installation assignment, pay, travel, and other administrative matters. The IIT NTR/SME reports to Ship Superintendent for operational and inspection matters concerning individual system installations.

3.8 IIT QUALITY MANAGER

The IIT Quality Manager is responsible to the IIT IMO and the Head, Fleet Engineering Department for the implementation, training, verification, and reporting of the SSC San Diego Quality System Plan.

3.9 IIT WATERFRONT PRODUCTION MANAGER

The IIT IMO Waterfront Production Manager is SSC San Diego's senior management, waterfront representative in support of all SSC San Diego and SSC Chesapeake Detachment Pacific IIT installation efforts. This IIT manager provides support to the IITs in the areas of cost, schedule, performance, and scope of work increases through managing the CORNs. The IIT Waterfront Production Manager is responsible for the senior management oversight of SSC San Diego government and contractor personnel, installation safety, quality, and production schedule issues to maintain an integrated installation team process and flow.

3.10 IIT C4ISR SYSTEM INTEGRATION TESTING LEAD

The IIT C4ISR System Integration Testing Lead is responsible for testing to provide an overall evaluation and assessment of the C4ISR connectivity, functionality, and interoperability on specific platforms at the end of availability. This evaluation and assessment allows additional time to identify C4ISR issues and resolve them before the ship gets underway.

3.11 FLEET SUPPORT OFFICER (FSO)

The Fleet Support Officer is responsible for the management and funding Fleet technical assists, Casualty Report (CASREP) responses, Alteration Engineering Requests (AERs), D-type ShipAlts, depot-level repairs, and minor equipment upgrades performed by SSC San Diego. The FSO interfaces with sponsoring activities, including Surface Forces, Pacific (SURFPAC), Commander, Naval Air Forces Pacific (AIRPAC), Submarine Forces Pacific (SUBPAC), Fleet Technical Support Centers (PAC/LANT), Regional Maintenance Center Port Engineers, Supervisor of Shipbuilding, Conversion & Repair (SUPSHIP), and others. The FSO is responsible for the coordination of CASREP and technical assistance response provided by SSC San Diego to Fleet In-Service Engineering Agents (ISEAs). The FSO is responsible for the review of incoming naval message traffic on a daily basis to help identify technical, logistic, and training problems reported by the Fleet. The FSO tracks and reports on CASREP status, and coordinates both internally and externally to SSC San Diego to ensure timely response is provided. The FSO supports the IIT by helping to recognize and correct problems in the Fleet related to installation discrepancies, thereby improving the integrated C4ISR installation process and providing a better quality product to the Fleet.

3.12 DESIGN AND PLANS COORDINATOR

The Design and Plans Coordinator provides interface between SPAWAR 04R-3 and SSC San Diego. The Coordinator manages shipchecks and drawing reviews between SPAWAR and SSC San Diego personnel. The Coordinator manages resources to develop Design War Room requirements for Alteration drawing and specification packages for review and use by contractors, BFO/Ms, IIT Ship Superintendents, and IIT NTR/SME. The Coordinator is responsible for the liaison between SPAWAR and SSC San Diego for the effective use of the Liaison Action Record (LAR) and CORN processes. The Coordinator also provides weekly reports to the IIT IMO, BFO/M, for the status of shipchecks, drawing reviews, drawing deliveries, and Design War Room accomplishments. The Coordinator is responsible for the identification of common design issues, development and implementation of process improvements to correct common design problems, and the mitigation of negative impacts of design issues. The Coordinator manages drawing reviews with the IIT Quality Manager to ensure drawings receive quality review before issue.

4. QUALITY SYSTEM REQUIREMENTS

4.1 MANAGEMENT RESPONSIBILITY AND AUTHORITY

4.1.1 Quality Policy

The Quality system resides as an integral function of the IMO, which reports directly to SSC San Diego D60 and D60F. The scope and complexity of the quality system requires considerable coordination among various organizational elements that have quality assurance and quality control responsibilities (e.g., IIT Ship Superintendent, IIT NTR/SME, SSC Chesapeake Detachment Pacific, and SSC San Diego. The Commanding Officer, SSC San Diego has directed that the D60 Department Head be directly responsible for the Command's C4ISR Shipboard Integrated Installations quality system. The D60 Department Head has established and documented organizational structure, responsibilities, functions, and lines of authority for all elements of the Quality System Program (figures 1 through 3). As a minimum, organization for the quality system is described in the following subsections.

4.1.2 Organization

Figure 1 shows the SSC San Diego organization.

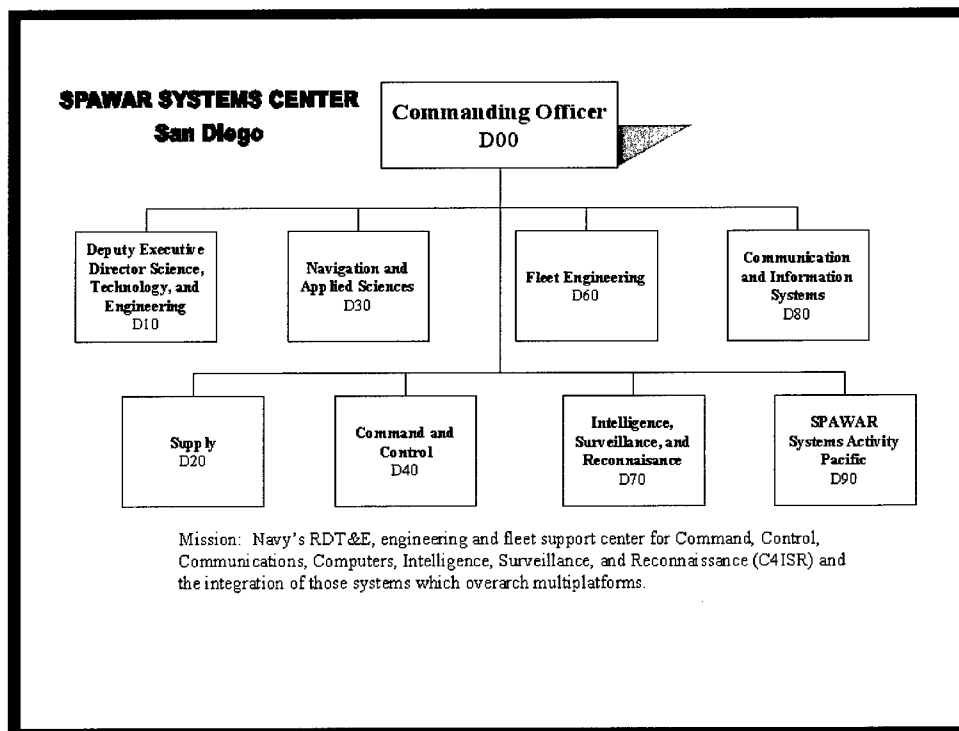


Figure 1. SSC San Diego organization.

**SPAWAR Systems Center
San Diego
Installation Organization**

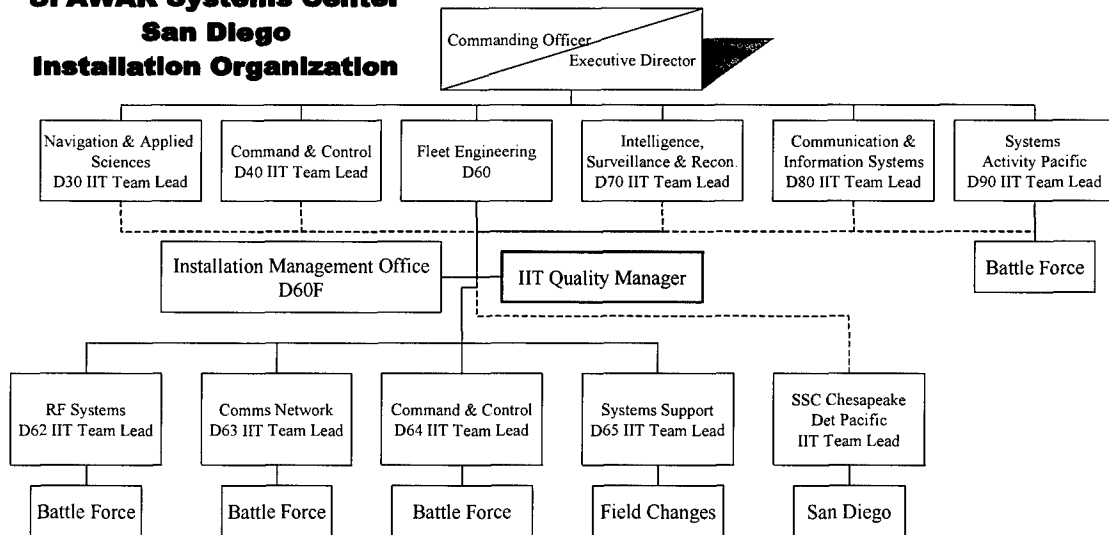
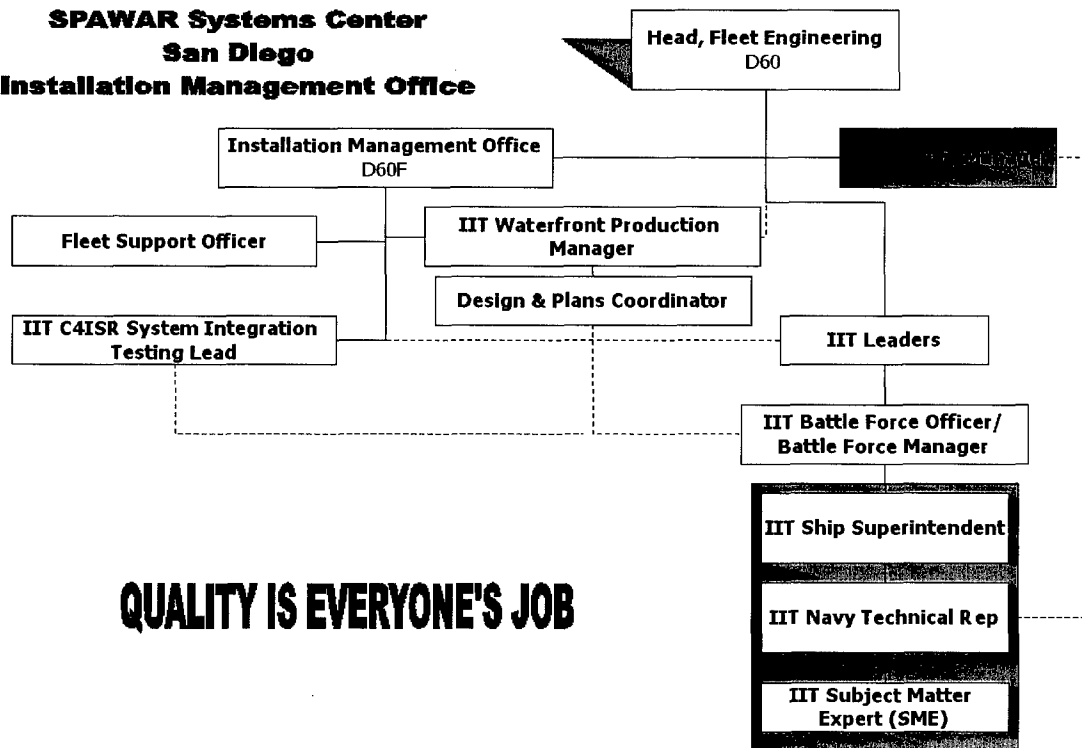


Figure 2. SSC San Diego installation organization.

**SPAWAR Systems Center
San Diego
Installation Management Office**



QUALITY IS EVERYONE'S JOB

Figure 3. SSC San Diego IMO organization.

4.1.2.1 Responsibility and Authority. The IIT Quality Manager is responsible to the Commanding Officer, SSC San Diego, for the development, implementation, and verification of procedures and processes. The IIT Quality Manager is also responsible and accountable for the coordination of the Quality System Plan across organizational lines within the Command and other System Commands. The IIT Quality Manager reports directly to SSC San Diego D60 and coordinates directly with D60F and is tasked for the following:

- a) Developing Command quality policy including developing and maintaining the Quality System Plan for review and approval by the Commanding Officer.
- b) Developing standardized procedures, criteria, training, and methods for implementation throughout the Quality System Plan.
- c) Assisting SSC San Diego D30, D40, D60, D70, D80, D90, IIT Leads, IIT BFO/M, IIT Ship Superintendent, IIT NTR/SME, SSC Chesapeake Detachment Pacific, and SSC San Diego in implementing and executing this Quality System Plan.
- d) Performing oversight to ensure compliance with this document and referenced requirements and reporting to SSC San Diego D60 using QP101, "Reviews."
- e) Responsible and accountable for verification of quality functions within Supply (SSC San Diego D20), purchasing, installation, test, and quality control.

4.1.2.2 Verification Resources and Personnel. The IIT IMO and the IIT Quality Manager will identify resource requirements. The IIT Leads will provide adequate, trained personnel and resources to implement the quality system that includes program management, work performance, and verification activities.

4.1.2.3 Management Representative. The SSC San Diego D60, Fleet Engineering Department Head has directed the IIT IMO to provide Quality Management for all SSC San Diego C4ISR integrated installations. The IIT Quality Manager is responsible and accountable for establishing, implementing, and maintaining the SSC San Diego C4ISR Integrated Installation Quality System Plan.

4.1.3 Senior Executive Continual Management Review

The Quality System policy and procedures are documented or referenced in the Quality System Procedure Manual and are under continual executive management review. The Quality System Manual and subsequent changes will be sent to NAVSEA San Diego for approval. Procedures referenced herein will be contained with the Quality System Procedure Manual. Internal reviews shall be conducted annually to ensure procedure effectiveness and continuous improvement using QP102, "Process Improvement." Records are kept in accordance with Section 4.15.

4.1.4 Management and Employee Responsibility, Authority, and Accountability

The Quality System clearly establishes management and work force responsibilities, authorities, and accountabilities for work quality. Work records provide for traceability to the individual

performing the work to recognize quality workmanship and to identify areas where quality improvement actions are necessary.

4.1.5 SSC San Diego Supply (D20)

SSC San Diego Supply (D20) is responsible for contract reviews and associated activities as required by reference 2.1.18 and 2.1.19. Initial Contract reviews are the joint responsibility of the IIT NTR, IIT Ship Superintendent, IIT Quality Manager, and the designated Contracting Officer Representative.

4.2 QUALITY SYSTEM

4.2.1 Quality Assurance Planning

Initial Quality Assurance program planning will include completing the Installation Process Check-Sheet or the Installation Process Check-Sheet for Prototype and Demonstration Installations identifying the quality assurance functions performed by the organization and communicated with the customer during the In-Briefing and during production. The Quality Procedure Manual provides procedures for systematically planning and performing these functions. These procedures define responsibilities and provide methods and criteria for implementing this document. Quality procedures will accomplish the following:

- a) Demonstrate an awareness, recognition, and organized approach to the achievement of quality assurance requirements.
- b) Establish budget procedures for Quality resources including budget preparation, allocation, and management control.
- c) Provide for reviewing work-authorizing documents to determine any additional quality assurance requirements. Where work-authorizing document provisions conflict with the requirements contained herein, the conflict will be reported by letter to the work sponsor. Conflicts will be resolved before beginning the work.
- d) Provide for including Quality Assurance/Control requirements in work-authorizing documents.
- e) Provide for performing the Quality system functions in-house and verifying they are adequately performed if contracted or delegated.
- f) Quality Work Item Planning. A separate Inspection Plan (IP) shall be developed for each Work Item. Each IP identifies the work to be performed, the sequence of events or actions required to perform the work, and documents that specify direction or control over the work, measuring work performance, organizational responsibilities, relationships, and approval authorities. An IP is prepared for each new Work Item, revised and updated as work proceeds.
- g) Quality Improvements. Each IIT establishes quantifiable quality improvement objectives. These objectives are directly related to ongoing and planned work and progress measured using quality measurement and tracking procedures. Both quality effectiveness and

efficiency are considered in establishing management and worker quality performance standards and measured results used as principal factors in performance appraisals. QP201, "Quality Improvement," documents the improvement process. The procedure identifies significant quality-related problems (any measurement requirement that exceeds present capabilities), determines factors causing the problem, and identifies specific corrective or improvement actions that must be implemented to solve the problem, and ensure effective action accomplishment.

- h) Design Drawing Reviews. Design reviews of SIDs are performed to evaluate pertinent aspects of the drawing and to assure that the necessary related requirements are included in the drawing documentation. Drawing reviews will reflect active participation by the IIT Ship Superintendent, IIT NTR/SME, and IIT Quality Manager. The planning, scheduling, and procedure to be followed in design drawing reviews are documented in the QP202, "Drawing Reviews." All drawing design reviews accomplish the following:
 - (1) Objectively examine the design drawings and are performed by personnel who have not been involved in the design process.
 - (2) Are conducted by competent specialists/subject matter experts in the various technical specialties.
 - (3) Provide for documenting the design drawing review results. A comprehensive and timely design drawing review report to the responsible Planning Yard must document areas reviewed, decisions reached with supporting rationale, actions taken, open issues or design deficiencies requiring further resolution, determinations as reported by technical personnel for identification of measurement requirements that exceed current capabilities that necessitates additional equipment be acquired for the task, and assessing design drawing readiness for installation.
 - (4) Assure that those drawings, specifications, technical and maintenance manuals, and other technical descriptions and data prepared during design are complete, accurate, usable, and meet the requirements of reference 2.1.1.
 - (5) Foster an atmosphere of free discussion between IIT NTR/SME, IIT Ship Superintendents, IIT Quality Manager, and the Planning Yard representative of the review's conclusions and the process by which they were arrived.
- i) Change Order Request Notification (CORN). In the process of accomplishing agreed-upon tasking, changes in production scope may occur. Changes to the established scope of production are documented and reviewed in accordance with QP203, "Change Order Request Notification."

4.3. CONTRACT REVIEW

The Quality system provides requirements for controlling procurements and support for supply system or other outside procurements of materials, equipment, and systems. Initial contract reviews are conducted, contract amendments processed, and records of these actions maintained. Contractor quality performance history is a factor in contractor source selection. Contracts are not awarded to

contractors with a history of poor quality performance. Contractor performance is maintained, reviewed, and monitored through use of achievement indicator data and surveys ensuring customer quality requirements are defined, documented, and agreed upon. Quality performance data are collected, analyzed, and used for corrective actions in procurements. The IIT Quality Manager is responsible and accountable for verification of quality functions within contracting, purchasing, installation, and test quality control. The Supply Department Contracting Officer and IIT IMO Contracting Officer's Representative are responsible for ensuring all relevant documentation is maintained, reviewed, and monitored for establishing and amending contracts.

4.3.1 Evaluation Criteria

Procurement source selection criteria are established and documented before initiating procurement action. Procurement requirements reviews will be conducted per reference 2.1.18 and using QP301, "Procurement Requirements Review."

4.3.2 Delivery Orders

Procedures for award of Delivery Orders are accomplished and documented using reference 2.1.19 and QP302, "Development and Preparation of Task/Delivery Orders." The Change Order Request Notice (CORN) process identifies quality requirements contained in amendments to a contract. The CORN process is the only method used to change the contract.

4.3.3 Quality Performance History

The candidate contractor's record of supplying products or services of the type procured, with acceptable quality levels and reliability, are an essential consideration in the source selection process. Performance history evaluations are based on documented quantitative information collected weekly by the IIT Ship Superintendent throughout a contract in the areas of the Installation Process, Planning and Schedule Control, Management of Personnel, Systems Integration, and Cost Control, and accomplished using QP302.

4.4. DOCUMENT AND DATA CONTROL

4.4.1 Document Control

Documents are reviewed and approved by authorized personnel before issue. Master lists of controlled documents that identify current revision status are maintained and available to preclude the use of obsolete documents. The Quality Manager is responsible for document control and ensures that current documents are available, obsolete documents are promptly removed from circulation, and obsolete documents are maintained for historical archives. QP401, Document and Data Control, defines the process in which documents are maintained, controlled, reviewed, and approved. The IIT Ship Superintendent is responsible for maintaining all installation records, Inspection and Test records, and contractor performance records for the installation.

4.4.2 Data Control

Changes to documents are reviewed and approved by the same authorized personnel that performed the original reviews (if available), unless specifically designated otherwise. Designated reviewers are provided access to background information and customer requirements on which to

base their review and approval. Changes to controlled documents are identified in the document or appropriate attachment, where practicable, as described in QP401.

4.5 PURCHASING

4.5.1 General

The IIT NTR/SME responsible for purchases shall ensure that the purchased product, materials, and services conform to specified customer quality requirements.

4.5.2 Assessment of Vendors

- a) The IIT NTR/SME or IIT Ship Superintendent shall select vendors based on their ability to meet the product requirements, including customer quality requirements.
- b) The IIT Quality Manager shall establish and maintain records of acceptable vendors. (See Section 4.15.)
- c) The selection of vendors, and the type and extent of control exercised by the IIT NTR/SME or IIT Ship Superintendent shall be dependent upon the type of product and, where appropriate, on objective records of vendor's previously demonstrated capability and performance.
- d) The IIT Ship Superintendent shall ensure that quality system process controls are effective and determine the level of control/oversight based on vendor performance quality and schedule adherence.
- e) These actions shall be in accordance with QP501, "Assessment of Vendors."

4.5.3 Purchasing Data

- a) Purchasing documents shall contain data clearly describing the product ordered, including, where applicable, the following:
 - (1) The type, class, style, grade, or other precise identification.
 - (2) The title or other positive identification, and applicable issue of specifications, drawings, process requirements, inspection instructions, and other relevant technical data, including customer requirements for approval or qualification of the product, procedures, process equipment, and personnel.
 - (3) The title, number, and issue of the quality system international standard to be applied to the product.
- b) These processes shall be in accordance with QP502, "Purchasing Data" and ensure that purchasing data are complete, accurate, in accordance with the job order specification, and conveyed on the purchasing document.

4.5.4 Verification of Purchased Products

- a) Where specified in the purchase order, the IIT NTR/SME or IIT Ship Superintendent or his representative shall be afforded the right to verify at the vendor's facility, or upon receipt, that the purchased product conforms to customer-specified requirements.
- b) This action shall be in accordance with QP503, "Vendor Product Verification."
- c) Verification by the IIT member shall not absolve the vendor of his responsibility to provide an acceptable product nor shall it preclude subsequent rejections of the product.
- d) When the IIT member elects to carry out product verification at the vendor's plant, such verification shall not be used by the vendor as evidence of effective control of quality by the IIT.

4.6 CONTROL OF CUSTOMER-SUPPLIED PRODUCTS

4.6.1 Records

The IIT NTR/SME shall establish and maintain records of the verification, storage, inventory, control, and maintenance of customer-supplied products provided for incorporation.

4.6.2 Lost or Damaged Product

Any product that is lost, damaged, or otherwise unsuitable for use, shall be recorded by the IIT NTR/SME and reported to the IIT Ship Superintendent, IIT Quality Manager, and customer. (See Section 4.15 of this document.) The IIT Ship Superintendent will report all discrepancies or damage in storage, inventory, maintenance, record keeping, and reporting of damaged or lost customer-supplied products to the IIT Quality Manager and the customer.

4.6.3 Procedure QP601, "Customer-Supplied Products"

Procedure QP601, "Customer-Supplied Products" has been established for storage, inventory, maintenance, record keeping, and reporting of damaged or lost customer supplied products.

NOTE—Verification by the IIT does not absolve the customer of the responsibility of providing an acceptable product.

4.7 PRODUCT IDENTIFICATION AND TRACEABILITY

4.7.1 Product Identification

Where appropriate, the IIT NTR/SME or IIT Ship Superintendent shall identify the product from applicable drawings, specifications or other documents, during all stages of product at receipt and during all stages of production, delivery, installation, and test. The IIT NTR/SME shall assign a unique identification to products or batches of products, where traceability is a customer-specified requirement. (see Section 4.15.)

4.7.2 Product Traceability

The IIT IMO has established the process QP701, "Product Identification and Traceability" for unique recorded traceability. The process documents procedures for identifying the product at receipt and during all stages of production, delivery, and installation. The IIT Quality Manager is responsible for the process verification and maintenance.

4.8 PROCESS CONTROL

4.8.1 General Processes

- a) The IIT NTR/SME and IIT Ship Superintendent are responsible to jointly manage, identify and plan the integrated production and, where applicable, installation processes, which directly affect quality, and shall ensure that these processes are carried out under controlled conditions and include the following:
 - (1) The monitoring and controlling of suitable process and product characteristics during production and installation, where the absence of such a procedure would adversely affect quality. The specification of suitable production and installation equipment, a suitable working environment, and compliance with reference standards/codes and quality plans.
 - (2) The approval of processes and equipment, as appropriate.
 - (3) The workmanship criteria, which shall be stipulated, to the greatest practicable extent, in written standards or by means of representative samples.
- b) These actions shall be in accordance with QP801, "General Processes" and verified by the IIT Quality Manager.

4.8.2 Special Processes

- a) These are processes, the results of which cannot be fully verified by subsequent inspection and testing of the product and where, for example, processing deficiencies may become apparent only after the product is in use. Accordingly, verification Check Points are established in the Work Specification that requires inspection at known production sequences. Other special processes require NAVSEA approval (e.g., Welding, Fiber-Optic Connectorization, etc.). These processes and personnel shall be qualified and shall also comply with the requirements of Subsection 4.8.1.
- b) The IIT Ship Superintendent shall maintain records for qualified processes, equipment, and personnel, as appropriate.
- c) These actions shall be in accordance with QP802, "Special Processes."
- d) The IIT Quality Manager will maintain a complete listing of all NAVSEA-approved procedures.

4.9 INSPECTION AND TESTING

4.9.1 Receiving Inspection and Testing

- a) The IIT NTR/SME is responsible for ensuring that the incoming products are not used or processed except in the circumstances described in Subsection 4.9.1(b) until it has been inspected or otherwise verified as conforming to specified contract and customer requirements with QP901, "Receiving Inspection and Testing" for receiving inspections.
- b) Where the incoming product is released for urgent production purposes, it shall be positively identified and recorded (see Section 4.15) to permit immediate recall and replacement in case it does not conform to the specified contract and customer requirements.

NOTE—In determining the amount and nature of receiving inspection, consideration should be given to the control exercised at the vendors and documented evidence of quality conformance (i.e., Certificate of Conformance/Compliance/Test data) provided by the vendor.

- c) These process actions shall be in accordance with QP901, "Receiving Inspection and Testing" for receiving inspections.

4.9.2 In-Process Inspection and Testing

- a) The IIT NTR/SME is responsible for the following:
 - (1) Inspect, test, and identify the product.
 - (2) Establish product conformance to specified customer requirements by use of process monitoring and control methods.
 - (3) Hold product until the required inspections and tests have been completed or necessary reports have been received and verified, except when product is released under positive recall procedures (see Subsection 4.9.1). Release under positive recall procedures shall not preclude the activities outlined in Subsection 4.9.2(a)(1).
 - (4) Identify nonconforming products.
- b) These actions shall be in accordance with QP902, "In-Process Inspection and Testing."

4.9.3 Final Inspection and Testing

- a) The IIT NTR/SME is responsible for final inspection and testing and shall ensure that all customer-specified inspections and tests, including those specified either on receipt of product or in process, have been carried out and that the data meet specified requirements.
- b) The IIT NTR/SME shall carry out all final inspection and testing to complete the evidence of conformance of the finished product to the specified requirements.
- c) No installation shall be considered complete until all the activities have been satisfactorily completed and the associated data and documentation is acceptable and authorized.
- d) These actions shall be in accordance with QP903, "Final Inspection and Testing."

4.9.4 Inspection and Test Records

- a) The IIT Ship Superintendent shall establish and maintain records that give evidence that the product has passed inspection and/or test within the customer-defined acceptance criteria, in accordance with QP904, "Inspection and Test Records." (See Subsection 4.15.)

4.10 CONTROL OF INSPECTION, MEASURING, AND TEST EQUIPMENT

4.10.1 Calibration and Maintenance of Measuring Devices

The IIT Quality Manager is responsible for the establishment of the calibration and maintenance program and its maintenance to provide the required precision and accuracy as specified by the customer for performance of work. IIT NTR/SME will verify and document the use of calibrated test and inspection equipment used for Acceptance Testing. Measuring devices are calibrated by the station or by a facility using standards traceable to the National Institute of Standards and Technology as required by ANSI/NCSL Z540-1-1994 or derived from accepted values or natural physical constants. If no national standards exist, the basis for calibration is documented.

4.10.2 Recall

The Quality system provides for the mandatory recall for calibration and maintenance within the established intervals. Measuring devices that have not been calibrated per the established schedule are immediately removed from service. If physical removal is impractical, the device is impounded by attaching signs or tags. In addition, provisions are made for immediate removal or impounding measuring devices that have failed in one or more parameters, show evidence of physical damage, or are determined or suspected as outside their required performance limits. Measuring devices are not used when impounded. New or repaired measuring devices are calibrated before use.

4.10.3 Labeling

Measuring devices are conspicuously identified as to calibration status. Calibration labels show the calibration date, by whom calibrated, and due date for next calibration. Devices that do not require a complete calibration, or are to be used for indications only, bear labels or tags that denote the limitations. When size or functional characteristics prevent label application, identifying codes are applied to indicate calibration status and due date for next calibration.

4.10.4 Records and Analysis

Records are established and maintained for the calibration and maintenance program. These records identify the measuring devices (e.g., nomenclature, manufacturer, model number, serial number, contractor identification, custodian, location), maintenance history, and calibration information (e.g., calibrations source, procedure, interval, due dates, calibration data). Calibration data are analyzed to determine deterioration trends and to provide realistic intervals revision to assure continued accuracy.

4.10.5 Out-of-Tolerance Conditions

Out-of-tolerance conditions are reported to the user and Quality Assurance for analysis. The results of this analysis, if it is determined that the condition had an adverse effect on the end product, is used to determine a course of action. All reported out-of-tolerance conditions, analyses, and corrective actions are documented.

4.10.6 Procedures

QP1001, "Calibration Test Methods and Procedures," is maintained and used to calibrate and maintain all measuring equipment and standards.

4.11 INSPECTION AND TEST STATUS

4.11.1 Inspection and Testing

The IIT NTR/SME performs inspection and Testing. The IIT Ship Superintendent is responsible to ensure inspection and has been accomplished to ensure conformance or non-conformance to customer requirements. All Testing results are forwarded to the IIT BFO/M for dissemination to the applicable System/Element Representative and customer. Random inspections are accomplished by the IIT Ship Superintendent to verify the quality of the installation that may include verifying wire wrapping, Terminal Checks, Crimp requirements, and other work that can be performed within the scope of the Alteration. Additionally, it is the responsibility of the IIT Quality Manager to verify that alterations added to the listing through the CORN process can be performed within the scope of this Quality System Plan.

4.11.2 Control of Quality Records

The IIT BFO/M maintains all Records used for the installation or monitoring of system installation and performance are maintained. The IIT Ship Superintendent ensures submission of the proper documentation required by the various activities involved with installation of a system. The IIT Ship Superintendent maintains all installation Instructions. Historical data indicating system performance is maintained by the applicable IIT NTR/SME or delegated to the appropriate IIT Ship Superintendent. The IIT Quality Manager maintains a copy of all Quality System Plans submitted and NAVSEA-approved for use.

4.11.3 Test and Inspection Records

All test records and inspections performed are maintained and controlled for a minimum of 1 year unless otherwise specified. Records are appropriate for the type, scope, and importance of the test or inspection performed and in sufficient detail to develop Quality Measurement and Tracking Indicators. All product deficiencies resulting from the installation process are reported to the IIT Quality Manager, IIT BFO/M, and IIT Lead.

4.11.4 Inspection Indicators

The established system for inspection status of conformance and non-conformance includes the following:

- a) Inspection indication devices are designed (stamps, seals, sealers) to indicate and assure compliance with requirements for quality, safety, security, and integrity as appropriate for the process. Status of inspection and test is documented in accordance with QP1101, "Inspection and Test Status."
- b) Inspection indications are required to indicate completion of special process, non-destructive examination, in-process inspection, and test.

4.11.5 QP1101 Procedure

The procedure QP1101, "Inspection and Test Status," describes and instructs the method used to document inspection and testing status. Identification of the system test status is maintained and controlled throughout the installation process to ensure compliance with customer requirements.

4.12 CONTROL OF NONCONFORMING PRODUCT

4.12.1 Control Method

The Quality system provides a method to identify, report, segregate, control, review, and dispose of nonconforming material. The IIT Quality Manager is responsible for the system improvement action, which identifies, notifies, and corrects the cause of non-conformance and effectively prevents recurrence. The IIT NTR/SME is responsible for the identification of non-conformance, notification to the IIT Quality Manager and IIT Ship Superintendent, segregation for storage, and holds for customer disposition of product.

4.12.2 Review Process

IIT personnel are designated and authorized for the review process of Nonconforming material offered for Material Review. One of the following dispositions is made in accordance with QP1201, "Material Review procedure" to meet the customer requirements.

- a) Manufactured material found to be incomplete or that can be corrected to meet specification requirements are released for correction or completion of operations.
- b) Accept the product/material/service with or without repair.
- c) Re-graded for alternative applications.
- d) Remove from use. Material obviously unfit for use and not economically repairable is processed per approved procedures to identify, control, and dispose of unusable material.
- e) Return to Supplier. Nonconforming material received from a supplier is returned for correction or replacement. The supplier is provided with non-conformance information and applicable instructions to resubmit corrected material and a corrective action report if required.

4.12.3 QP1202

QP1202, "Control of Nonconforming Product," is used to ensure that nonconforming material is controlled to prevent its unauthorized use and notification of the appropriate activities or parties.

4.13 CORRECTIVE AND PREVENTIVE ACTION

4.13.1 Procedures and Method

SUPSHIPSDIEGOINST 4855.4G provides the procedures and method for the Corrective Action Program with reporting, analyzing, and correcting discrepancies found during an Alteration Installation. Procedure QP1301, "Corrective and Preventive Action," also applies. The IIT Quality Manager is responsible for the maintenance and implementation of this procedure. Procedure

QP1301 details methods for using quality data to detect, analyze, and eliminate potential causes of non-conformance, the steps required to deal with problems requiring preventative action, and notify management of confirmation that quality data and action taken for their review. The IIT Ship Superintendent, IIT NTR/SME, or the IIT Quality Manager may initiate Corrective Action Requests. The IIT Quality Manager coordinates the corrective action and non-conformance cause with the responsible party, IIT IMO notification, tracking, and closure.

4.13.2 Corrective Action

The Quality system provides the following corrective action procedures when a non-conformance exists:

- a) Effective handling and closure of non-conformance that may have been identified through customer complaints or reports of nonconformity.
- b) Investigating the cause of the non-conformance and the corrective action needed to prevent recurrence.
- c) Initiating preventative actions and to develop corrective action to prevent the recurrence.
- d) Applying controls to ensure corrective actions are taken and that they are effective.
- e) Implementing and recording changes in procedures resulting from corrective actions.

4.14 HANDLING, STORAGE, PACKAGING, PRESERVATION, AND DELIVERY

4.14.1 Handling

The IIT NTR/SME is responsible for ensuring procedure QP1401, "Handling, Storage, Packaging, Preservation, and Delivery," is used for parts material control. The IIT NTR/SME verifies that items are protected and controlled during storage, handling, preservation, and manufacturing operations by performing the following:

- a) Providing proper environmental protection including electrostatic sensitive device protection per QP1401.
- b) Preventing issue or use of items whose shelf life or service life has expired.
- c) Purging items whose shelf life or service life has expired.
- d) Periodically inspecting stored items for expiration, deterioration, and damage.
- e) Assuring designated handling equipment is used.
- f) Items of unknown status and quality are not permitted in the work areas. Surveillance of parts and material storage and issue controls is conducted to assure that approved procedures are being used and established controls are effective.

4.14.2 Storage and Issue

This section establishes controls the IIT NTR/SME ensures and verifies for material in storage and for material issue and shipment processes, QP 1402, "Delivery Receipt," applies.

- a) Storage Controls. Material held in storage is properly identified, segregated, controlled, and protected to prevent deterioration, damage, degradation, or unauthorized issue. First-in-first-out issue is observed whenever possible.
- b) Control of Age-Sensitive Material. The Quality system provides positive effective controls to prevent damage, loss, deterioration, degradation, or unauthorized issue and use of age-sensitive material. The shelf-life controls include provisions for maintaining serviceability condition status changes required because of aging.
- c) Storage Environmental Controls. Materials, which are susceptible to environmental deterioration, are placed in storage facilities maintaining the required environment for preservation. Procedure QP1402 provides for monitoring and recording storage environmental conditions and for disposition of material that have exceeded specified environmental limits.

4.14.3 Packaging and Preparation for Storage

Procedure QP1402 has been developed and implemented for preservation, packaging, marking, handling, and transporting all material. If requirements or procedures are not specified in the technical data package, the IIT NTR/SME ensures that Work Instructions are prepared.

4.14.4 Delivery

Proper protection required to maintain quality after final test and inspection is applied to all products. When required, the IIT NTR/SME ensures that protection is extended to include delivery to destination.

4.15 CONTROL OF QUALITY RECORDS

4.15.1 Procedures

Establish and maintain documented procedures for collection, indexing, maintenance, and disposition of quality records.

4.15.2 System Description

The system described in this section of the manual complies with the requirements of NAVSEA Standard Item 009-04, NAVSEA Technical Specification 9090-310C, and ANSI/ASQC 9002.

4.15.3 Responsibility

The IIT Quality Manager has the responsibility for controlling quality records as shown in Section 4.1. The IIT Ship Superintendent maintains the Integrated Installation Work Specifications, Inspection, Test, and Integrated Test Plans. The IIT NTR/SME monitors the work progress and documents the acceptability of the work in the IIT Ship Superintendent's work package.

4.15.4 QP1501

QP1501, "Control of Quality Records," defining the methods and responsibilities for the control of quality records.

- a) To demonstrate compliance with customer, ensure that the IIT Ship Superintendent maintains pertinent quality records of performance and subcontractor quality records of performance.
- b) Quality records are legible and identifiable to the product or process involved. The records are stored with the IIT Ship Superintendent, with a backup copy stored with IIT BFO/M to provide safekeeping, and ease of retrieval.
- c) Retention time of the quality records is a minimum of 1 year after end of task, or as specified in the tasking. Access to these records is provided to the customer upon request. The authority for disposal of the records is under the authority of the IIT Quality Manager.
- d) Records are stored in any media form, such as hard copy or as electronic media. Records maintained include as a minimum, internal quality audits, training records, quality indicator data, and inspection and test status reports.
- e) Records of non-conformance or discrepancies are monitored until the IIT NTR/SME accepts corrective action. Summaries of quality assurance evaluation results and actions taken are developed and distributed to the IIT Ship Superintendent. The IIT Quality Manager is responsible for verifying that the records are controlled and maintained.

4.16 INTERNAL QUALITY AUDITS

4.16.1 Procedures

Establish and maintain documented procedures for verification of quality activities compliance with planned arrangements and to determine effectiveness of the quality system.

4.16.2 System Description

The system described in this section of the manual complies with the requirements of NAVSEA Standard Item 009-04, NAVSEA Technical Specification 9090-310C, and ANSI/ASQC 9002.

4.16.3 IIT Quality Manager

Internal quality audits shall be the responsibility of the IIT Quality Manager. The IIT Quality Manager is responsible for developing, managing, and the execution of the Audit Plan to ensure that the customer requirements have been complied with and documented. The IIT Quality Manager reports audit results, conformance, and non-conformance to The IIT NTR/SME, IIT Ship Superintendent, IIT Leads, and the IIT IMO.

4.16.4 Requirements

QP1601, "Quality Audits," defines the methods and responsibilities for performance of quality audits.

- a) All elements of the quality system are objectively audited at a minimum every year, with the quality control office providing statistical references for determining audited element frequency.
- b) Results of audits are documented, reported, and reviewed with IIT management personnel (IIT IMO, IIT Leads, IIT Ship Superintendents) having responsibility in the areas audited, as required by QP1601. These records are maintained controlled in accordance with QP1501.
- c) Personnel responsible for an audited area provide a plan of action and milestone showing when and how corrective action on deficiencies found by an audit will be corrected. IIT Management is provided the plan and corrective actions to ensure audit findings are resolved to their satisfaction. The plan and corrective actions is documented, with these documents maintained as required by QP1501.

4.17 TRAINING

4.17.1 Procedures

Establish and maintain documented procedures for identifying the training needs and provide for the training of all personnel activities affecting quality.

4.17.2 System Description

The system described in this section of the manual complies with the requirements of NAVSEA Standard Item 009-04, NAVSEA Technical Specification 9090-310C, and ANSI/ASQC 9002.

4.17.3 Schedules/Training Requirements

The IIT IMO office schedules and provides IIT Ship Superintendent and IIT NTR/SME training that is required. Identification of appropriate training required for the IIT Ship Superintendents and IIT NTR/SME is the responsibility of the IIT Lead. The IIT Lead considers the individual's education, training, and/or experience when determining required appropriate training for their assigned work.

4.17.4 QP1701

QP1701, "Training," defines the methods and responsibilities for performance of training.

- a) IIT Management ensures that all personnel are properly trained, and possess the knowledge, skills, and work guidance to perform assigned work. A combination of education, training, and/or experience will be considered to meet training requirements. Training programs have a means of measuring effectiveness and records of completed training are maintained.
- b) A training matrix supplied by the IIT IMO is used to identify classes required for subject personnel. This matrix also identifies the resources of the training.
- c) Training needs are periodically assessed to determine requirements for additional training.

4.18 STATISTICAL TECHNIQUES

4.18.1 Procedures

The IIT IMO has established and maintains documented procedures for identifying adequate statistical techniques required for establishing, controlling, and verifying the acceptability of process capability and product conformance to the customer's requirements.

4.18.2 System Description

The system described in this section of the manual complies with the requirements of NAVSEA Standard Item 009-04, NAVSEA Technical Specification 9090-310C, and ANSI/ASQC 9002.

4.18.3 IIT Quality Manager

The IIT Quality Manager is responsible for the use of statistical techniques to verify that the quality system is effective.

4.18.4 QP1801

QP1801, "Statistical Techniques," defines the methods and responsibilities for statistical techniques.

- a) Quality Indicators are established for each task, and used to measure, track, and report quality achievements and used to assist in identifying and resolving related problems. This data will be analyzed and reported to the IIT IMO.
- b) Indicator data is utilized to show any need for quality improvement on projects, and as input for IIT IMO organizational and quality improvement objectives.
- c) Effective communication of IIT Ship Superintendent and IIT NTR/SME, IIT IMO organization quality achievements in relation to established quality standards is provided to workers and management.

APPENDIX A
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Technical Document 3121

Quality System Plan for Command, Control, Communications, Computers, Intelligence,
Surveillance, and Reconnaissance Integration Installation Teams (November 2001)

Literature Change

1. Please destroy copies of TD 3121 mailed to you in December 2001.
2. Enclosed are corrected copies.

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